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The Development of Lesson Design to Improve Collaboration Activities and Scientific Work of Student at SMAN 6 Ternate Based on Lesson Study for Learning Community

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Abstract. The device for learning specifically RPP is one of the determinants of the quality of the process and learning outcomes. RPP is planning the implementation of learning designed by the teacher to achieve one basic competency. Development of lesson plans is strongly influenced by teacher competencies in interpreting learning competencies to be achieved. This research aims to develop Lesson based Lesson study for learning community that is developed collaboratively and creative for quality learning. The results of this study indicate that design Lesson developed very effectively for teachers in learning to create classroom learning innovations, the design lesson developed is concise and based on the identification of problems in classroom learning, the design lesson developed can enhance collaboration and scientific work activities of students at SMAN 6 Ternate concept of dicot and monocot plants. Design lesson can be used as an instrument for teacher collaboration activities in preparing learning tools, especially lesson plans.

Keywords: Lesson Design, Collaboration, Activities, Lesson Study, Learning Community

INTRODUCTION

One of the problems faced by the world of education is the low quality of the learning process. During this time there is a tendency in the learning process, students are less encouraged to develop critical thinking skills, collaborative, communicative and creative. Based on Minister of National Education Regulation (Permendiknas) number 41 of 2007 concerning Process Standards, requires educators in educational units to be able to develop Learning Implementation Plans (RPP). One element in RPP is the learning method. Based on this, the teacher is expected to develop learning methods that are able to enable students to think critically and be able to collaborate. The ability of the teacher in designing lesson plans plays an important role in determining the success of the learning and learning process.

Lesson Design (LD) is an alternative development of learning devices in the implementation of Lesson study. Lesson design can be developed from the standard RPP that has been developed by the teacher. The characteristic of lesson design is that there are components of learning problems, competencies to be achieved, methods, assessments and target students. Another characteristic is that task sharing and jumping task activities. Lesson design is developed with the philosophy of achieving democratic, collaborative and creative learning [1].

Lesson design In this study developed based on Lesson study for Learning community at SMAN 6 Ternate. Lesson Design was developed based on an analysis of classroom learning problems, innovation needs and learning competencies to be achieved. The main material being taught is spermatophyta which has been considered less attractive from student. Furhemore in present students are not able to distinguish the characteristics of dicotyle and monocotyl plants. The Discovery learning model is one of a learning model that recommended in the 2013 curriculum. But the implementation of this model is very much experiencing obstacles. Through the development of Lesson Design by collaborative is expected to be able to compile learning tools that are more simple, effective and innovative. Discovery learning in this design lesson product is a learning model that requires students to develop thinking skills, discover concepts, foster the ability to cooperate, and develop collaborative attitudes. In discovery learning models are designed conditions that require students to get important knowledge, make them proficient in finding concepts through data collections, and have their own learning strategies and have the skill to participate in teams [2]. Discovery Learning of Lesson design in the concept of seed plants is designed collaboratively and innovation in the implementation of learning that attracts students to inquiry.

EXPERIMENTAL METHOD

This type of research is development research (Research and Development), namely the type of research that develops a new product or perfects a product that has been there before [3]. This development research refers to the 4-D teaching material development model (four-D Model) proposed by [4] which consists of four stages, namely defining, designing, developing, and developing. and the stage of dissemination (disseminate) [5]. In this research the disseminate stage was carried out through an open class attended by observers. The product developed is Lesson design (LD). Analysis of data obtained from the validator is descriptive in the form of suggestions and comments. Overall data processing formula:

$$P = \frac{\sum x}{\sum xi} \times 100\%$$

Where:

- P : Percentage
- $\sum x$: Number of assessment answers
- $\sum xi$: The highest number of answers

TABLE 1. Percentage and Validation Criteria for Results of Lesson Design Products

Prosentase	Criteria of validation
76-100	Valid
56-75	Valid enough
40-55	Les valid (revised)
0-39	Invalid (revised)

RESULT

The results of the learning device product validation are in the form of design lesson (LD) as in table 2 below:

TABLE 2. Results of validation of Lesson design

Number	Validator Name	Result	Criteria
1	Expert development validator	78	Valid
2	Expert validator Lesson study	76	Valid
3	Expert validator Learning device	81	Valid
4	Material expert validator	76	Valid
Average		77,8	
Criteria		valid	

Based on table 2 above, it can be seen that design lesson products developed through Lesson study for Learning Community are categorized as valid or suitable to be used as learning devices. The design lesson developed is the lesson design class X IPA concept of seed plants with learning models of learning Discovery.

Limited Test Result Data (Open Class)

Data and analysis from limited test result data of development Lesson design is using open class in class X IPA SMAN 6 Ternate. Student learning outcomes in the form of sharing tasks and jumping tasks like table 4 below

TABLE 3. Student learning outcomes

Average rating aspects	Sharing task	Jumping task	Enhancement	category
	81,5	81,75	0,70	middle

Based on table 3 above, it can be seen that the implementation of design lesson in learning the concept of seed plants can improve student learning outcomes in the medium category. This means that there is an increasing student learning outcomes after the Lesson Desain is implemented.

Student Activity Data

Student activity data during the implementation of design Lessons in the implementation of open classes can be seen in table 5 below

TABLE 4. Student activities

Number	activity	Results	Information
1	Non-verbal activities of students during learning	75	Enough
2	Interaction between students	77	well
3	Involvement of low academic ability children	75	Enough
4	Oral activities (diskusi)	77	well
5	The level of assignment given by the teacher if it is related to the facts that exist in students	76	
6	Efficiency of classroom learning (how high / high collaboration occurs in students)	80	
7	Interactions / relationships between devices (learning) such as media, text, blackboards, student equipment etc.) - student-concepts (material provided by the teacher)	76	
Average information			76,57 well

Based on table 4 above, it can be seen that student activities during learning in the class are in a good category.

Teacher Activity Data

Teacher activity data during the implementation of design Lessons in the implementation of open classes can be seen in table 5 below

TABLE 5. Teacher Activities

Number	Activities	Result	Information
1	Open lesson	75	Enough
2	Main activities	76	Good
3	Closing lesson	78	Good
Average Information			76,33 Good

Based on table 6 above, it can be seen that teacher activity during learning in the classroom is in a good category.

DISCUSSION

Learning devices in this study were developed based on findings from [1]. The preparation of the design process is the first step to implementing learning processes quality base on lesson study. In lesson study can be prepared Lesson design as good learning tools that are operational and practical [6]. In the Learning devices in this study can stimulate students to learn to communicate, collaborate and be critical through discovery learning based on lesson study. This is in line with the concept of lesson study for learning improvement from [7]. In the discovery learning model in this study as an alternative teacher/lecturer presents the real world into the classroom and encourages students to make a connection between the knowledge they have and their application in daily life, constructing it themselves, as a provision to solve problems in their lives as community members [8].

Based on the results of the study of [9] collaborative learning through heterogeneous groups can accelerate learning in groups, and improve the performance and overall behavior of students in the group. While giving complex problems can improve learning efficiency in each group member. Students with high, medium and low academic can experience obstacles. So that collaborative learning is needed which can facilitate all students to learn effectively.

Learning devices in this research are arranged systematically using several stages in the Thiagarajaan 4D model, so that they teacher are easily developed and implemented. The preparation of learning devices (LD) is also equipped with work sheet which is a guide for students in implementing collaborative learning activities in discovery learning based on Lesson study. Thus, students are expected to be able to follow the overall subject matter well, so that they have mastery of knowledge and skills that are intact on the concept of seed plants, especially dicots and monocots. This can be seen from the value of student learning outcomes in the sharing task and jumping task. Likewise student activities during learning are in the Good category. This is in line with [10].

Giving problems to *sharing tasks* and *jumping task* will motivate students to think more broadly and deeply in finding diverse solutions. Task sharing is a learning activity by using individual tasks through collaborative small groups that contain material content that is in accordance with the textbook. While jumping tasks is a learning activity by giving problems with higher difficulty to increase ("jump" / "jumping") the ability of students from actual abilities to potential abilities. Problems with jumping task contain basic material that has been developed, namely application material from basic concepts [11]; [12].

CONCLUSION

Lesson design is one of alternative to the development of learning tools derived from standard RPPs by teachers. Through the development of design lessons, learning tools that are operational and effective will be produced to improve the quality of learning. The development of Lesson design in this study is Lesson study for learning community lesson-based design lessons at SMAN 6 Ternate city.

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